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Inching Toward Armageddon: A Psychiatric View

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The existence of thermonuclear arsenals capable of destroying much of humanity takes its origins from, and has an influence on, processes that are largely psychological. The threat to use a single nuclear bomb to resolve contemporary conflict is an anathema in part because complex nation-states did not evolve with surviving a nuclear war in mind. The atomic arms race has proceeded apace because of maladaptive psychological mechanisms including denial, distortion, projection, and, most relevantly, the need to enhance bonding within groups by creating stereotypes. One consequence of the arms race is a climate of fear and hopelessness, an especially destructive effect of which is seen in children. The physician's role in the prevention of nuclear war is critical, but divided between contradictory roles. On one hand, the physician is traditionally identified as a non-political advocate of the sick; on the other, as an advocate for the public health. It is this second model that enables physicians most legitimately to work for the prevention of nuclear war and to deal with the psychiatric concomitants of a planet drifting toward disaster.

It was Albert Einstein who wrote Sigmund Freud a half century ago to exhort the psychiatrist to identify the "strong psychological factors" leading the world to war once again. The preamble of the constitution of the United Nations Educational, Scientific, and Cultural Organization echoed this same point in the years following that war, observing, "Since wars begin in the minds of men, it is in the minds of men that the defenses of peace must be constructed." Despite such intuitions, the world has continued to spend progressively greater amounts for armaments, the most noxious part of which is the estimated 44,000 nuclear warheads held evenly by the United States and the Soviet Union.

This paper seeks to examine three related questions. If the arms race has a psychological basis, what is it? If the threat of nuclear war has specific psychosocial consequences for individuals in general, and children in particular, what are they? And, finally, what can the medical profession actually do about the arms race, caught as it is between contradictory roles of apolitical servants of the sick, and advocates of the public health?

These questions are more urgent than ever before. Since the first atomic test at Alamogordo, New Mexico, in 1945, the world's nuclear armamentaria have only grown larger. No treaty, pact, or understanding has even been created that has decreased the numbers of such weapons, which today have the explosive equivalent of one million Hiroshima-sized bombs. No human institution exists that can protect

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the earth from a catastrophic combination of international tension and a fallible leader who possesses first-strike nuclear technology. At present, five nations have nuclear weapons. By the year 2000, a dozen or more nations are likely to be on that list. Congressional studies by the Office of Technology Assessment have set possible fatalities for a general nuclear war as high as 88 percent of the entire American population within the first thirty days of such an attack [1]. Medical studies have induced that post-attack treatment facilities which still existed would be wholly unequal to the task of managing the care of the millions of victims still alive from such an onslaught [2].

With a deepening comprehension of such realities, Americans have tended to divide into what Mack has called "thinkables" and "unthinkables." The former camp, exemplified by government officials charged with the responsibility of preparing for and waging nuclear war, sees that event as a potentially necessary evil. The latter, comprising a growing number of physicians, scientists, clergy, and laity, sees that event as morally and politically unacceptable [3]. The admission of atomic fission into the conduct of contemporary statecraft has inadvertently opened the door to a condition of *ex falso quolibet,* in which an irrational premise ("nuclear war is a viable political option") is carried through to absurd conclusions.

Accordingly, the U.S. Postal Service has devised a 300-page plan which suggests, among other items, that shortly before a nuclear war individuals fill out emergency change-of-address forms to help with the mail following the holocaust [4]. A crisis relocation plan has been devised for New York City on behalf of the Federal Emergency Management Agency that calls for transporting the city's eleven million inhabitants, using two million automobiles, half of the nation's supply of Boeing 747 aircraft, three-quarters of its supply of DC-10s and L1011s, a flotilla of assorted tugs and barges, and the packing of persons on to freight cars [5]. Once sheltered in host communities, survivors are advised by yet another study to reduce the likelihood of radiogenic cancers by instructing only the elderly to leave the shelter to forage about the radioactive environment [6].

The logic of nuclear strategists is no less noteworthy. In an article by two Defense Department consultants one reads, "Nuclear war is unlikely to be an essentially meaningless, terminal event. Instead it is likely to be waged to coerce the Soviet Union to give up some recent gain. Thus, a president must have the ability not merely to end a war, but to end it favorably. The United States would need to be able to persuade desperate and determined Soviet leaders that it has the capability, and the determination, to wage nuclear war at ever higher levels of violence until an acceptable outcome is achieved" [7]. Similarly, the Director of Research and Engineering for the Pentagon in testimony to Congress explained a rationale for defense planning that has consumed 1.5 trillion dollars since 1945, and which, according to present plans, will require the expenditure of that amount in the next five years, by saying, "We are moving ahead to make sure that, whatever they do, or the possible things we imagine they might do, we will be prepared. We see possible threats on the horizon, usually not something the enemy has done, but something we may have thought of ourselves that he might do, and that we must therefore be prepared for" [8].

Attributing to an implacable enemy the capacity to devise an endless combination of threats to one's security may have the ring of a paranoid nightmare about it, but such thinking appears to have served as a precondition for the development of nuclear weapons systems by the superpowers since 1945. As the numbers of nuclear weapons have risen since then, however, governmental utterances regarding the utility of nuclear weapons as tools of foreign policy have become increasingly implausible. When the United States confronted the Soviet Union in 1962 over the

emplacement of missiles in Cuba, the U.S. had more than 6,000 strategic warheads, compared to the Soviet arsenal of thirty. With rough strategic parity between the superpowers in the last quarter of this century, however, brandishing the nuclear saber is tantamount to an invitation to mutual national suicide.

It is more than a little surprising, then, when a vice president of the United States was quoted describing his conviction that a nuclear war is "winnable" [9]. Such language may be intended to intimidate an enemy, but it may also disclose a failure of modern leaders to comprehend the social and medical consequences of the technology at their fingertips. Giving world leaders the benefit of the doubt, psychiatrist Jerome Frank has conceptualized the nuclear arms race as an example of a particularly expensive game of psychological warfare. Yet even if the game is played with one's eyes open, technology shapes behavior, and it is a rare statesman who possesses both the political and technological expertise to perceive the interaction. Additionally, the language of nuclear war preparation may have the unwanted psychological effect of habituating the public to the likelihood of the event, and so make nuclear war more acceptable.

If an important root of the arms race is psychological, can it be better defined? Sadly, the history of such efforts is as diverse as the results are divided. In his response to Einstein, Freud was skeptical that psychiatry had relevance to the study of international conflict. Since that time the psychological roots of war have been attributed to instinctive aggression, faulty perceptions between nations, xenophobia, greed, and the quest for territory. There is no unified body of data on the subject, as there is, for example, in the physical sciences. Nevertheless, two psychological propositions emerge from the literature that may serve to brighten an otherwise unillumined landscape.

THE DRIVE TO FORM STEREOTYPES

It is plausible to suspect that the act of dichotomizing social groups into hostile and friendly factions may reflect a common psychobiology visible in much of animate nature, of which the phenomena of stereotyping [10], distortion of the image of the enemy [11], and dehumanization [12] are sophisticated elaborations. The psychobiology of human aggression is in its infancy, but one of its expressions may be the prevalence of social, ethnic, religious, and national stereotyping throughout history.

Allport defines a stereotype as "an exaggerated belief associated with a category. Its function is to justify (rationalize) our conduct in relation to that category" [13]. That stereotyping may represent a legitimate psychobiological need for cognitive stability about one's environment is a disturbing concept in need of careful examination.

Pinderhughes has presented such a thesis, which suggests that a psychological need to dichotomize reality into positive and negative categories may not be as much Manichaean as it is a drive to create affiliative, loving bonds and differentiative, aggressive ones. Such a psychological process he calls differential bonding [14]. Support for the hypothesis comes from clinical observations in human beings throughout much of the life cycle, as well as the ethological observations of Lorenz [15]. The latter, for example, conceptualizes that the formation of bonds between members of the same group are intensified by aggression directed toward individuals outside of the group, a phenomenon readily observable by any group psychotherapist who admits a new member into an already established group. Even temporary exit from a group is capable of inviting aggression on re-entry to the group for some species.

House rats, for example, living in harmony in the same colony will attack one of

their kind if that rat has the bad luck of being moved from the first enclosure to a second and back to the first one again. Lorenz concludes, "The principle of the bond formed by having something in common which has to be defended against outsiders remains the same, from cichlids defending a common territory or brood, right up to scientists defending a common opinion and—most dangerous of all—fanatics defending a common ideology. In all these cases aggression is necessary to enhance the bond" [16].

But as Pinderhughes points out, the creation of an affiliative bond may have as a consequence the sacrifice of perceptual objectivity. He says, "The biological process of differential bonding offers stability and certainty at the expense of objectivity and validity, producing a biologically mature organism that may know it is right even when it is wrong. This, in my opinion, constitutes the main source of bias in human thinking and behavior and the primary basis of social conflict" [17]. Such a process, it would appear, may underlie much of the nuclear arms race between the superpowers.

Distortion of the image of one nation by another is a point made by many social scientists [11,12]. Bernard et al. have defined this process as one of dehumanization, in which one group views a second "as though they do not quite belong to the 'human race'" [18]. Selective dehumanization may serve an adaptive function in any task that calls for a suppression of the likely human emotional exchanges between individuals if feelings are not central to the task. One expects emotional control from surgeons, policemen, and a host of others whom society asks to function under emotional pressure.

But dehumanization may also be maladaptive, as in the behavior of concentration camp officials or the bureaucratic *mores* of nuclear war planners. A striking example of dehumanization in wartime is to be found in the personal journal of President Truman, who wrote shortly before the bombing of Hiroshima and described the enemy as "savages, ruthless, merciless and fanatic . . ." [19]. Dehumanization of the enemy freed the president from the moral qualms of the indiscriminate killing of 100,000 persons at a single blow. Historians may debate whether such an act was justifiable, but the process of dehumanization goes on and appears to serve a prominent role in the psychological basis of contemporary animosities.

Maladaptive dehumanization and the putatively physiological paranoia it springs from appear to be global in scope. Paranoid thinking as part of international policy has even come to be reflected in the technology used to promote that policy. The North American Air Defense (NORAD) system of enemy missile detection, for example, is intentionally designed to react to a large number of false positive events signifying a nuclear attack against the U.S.

In the 18 months of 1980 and 1981 this system reported 147 false alarms which required rapid, high-level adjudication to decide if the U.S. should begin a nuclear counterattack. The ostensible reason for designing a detection system to overreact to stimuli is to prevent a failure in detecting an attack when one is actually under way. But, for any given sample of data, decreasing the magnitude of an error of detection failure increases the magnitude of error in false positive responses [20]. This system of data processing is strikingly analogous to the thought processes of the paranoid psychotic, whose burden it is to scan the environment incessantly for hostile cues. The result of this behavior is not infrequently the unwarranted assault on an innocent person. The analogy has limited usefulness, however, since neither of the superpowers is likely to regard each other as innocent, poised as both are to destroy each other on a moment's notice. On the other hand, the evidence for a technological ex-

pression of what Pinderhughes has called "non-pathological group-related paranoia" is hard to ignore.

A positive note, however, is that technology has also accelerated the sharing of information between and within nations, most dramatically by satellite, computer, and television, each of which serves to reduce stereotyping. The power of such technology to threaten closed societies such as the Soviet Union has not been lost on the leadership of the latter, where the ownership of a video recorder is considered seditious. Frank, in describing the history of how Americans viewed their enemies, relates a major shift in American images of the Germans, Japanese, and Russians over time. The extent to which communications media contributed to such changes, and may continue to do so, appears undervalued. It is notable, for example, that in 1966 Americans described the Chinese most often as warlike and sly. After President Nixon's much-heralded visit to China, however, Americans described the Chinese most often as hard-working and practical [11].

If there is a physiological basis to aggressive bonding, the complexity of the human psyche, with its capacity to learn and use ever-new forms of information, may yet help us overcome what Jonas Salk has described as "evolutionarily disadvantageous thinking."

THE KNOWLEDGE OF PERSONAL DEATH

The human species stands alone among the beasts of nature in its knowledge of mortality. The foreknowledge of personal death may play two roles in the arms race—as a causal factor and as a factor that is radically disturbed by the threat of annihilation.

In his penetrating analysis of the role death plays in the life of the mind, Yalom [21] argues convincingly that although death and life may be separable in a biological sense, they interpenetrate one another psychologically through each step of the life cycle. "Even in birth we die," wrote Marcus Manilius, "the end is there from the start." Anxiety of death, and the psychic defenses against this anxiety, Yalom believes, become the cornerstones of the development of the mind in sickness and health. Melanie Klein, basing her conclusion on work with children, feels that the fear of death is part of the infant's earliest life experience, which in turn is the original source of anxiety. How one defends against this anxiety becomes a determinant in personality, behavior, and psychopathology.

Whether progenitors of the arms race have an inordinate death anxiety, which they stave off by a quest for power, remains to be examined. There is some evidence, however, that persons in death-related professions, such as medicine and the military, exhibit fewer conscious death fears than the general population, but at deeper levels appear to have more [22].

If the knowledge of death may play a role in advancing the arms race, what does the threat of nuclear annihilation do to our conventional modes of coping with mortality?

Robert Lifton has described five ways in which we seek immortality symbolically. One may live on through one's children, creations, or religion. A person may survive by union with an eternal nature. One may be able to lose oneself, and the thought of one's death, by immersion in an intense state of the present which Lifton calls an experiential transcendent mode. Since the development of nuclear weapons, he notes, we have developed a pervasive sense of potential annihilation that casts all such psychological constructs into doubt [23].

The anxiety of nuclear death can be masked, of course, by denial. A colleague

once shared with me the results of a survey of hospitalized patients that correlated curiosity about one's diagnosis and the gravity of that diagnosis. The more serious the illness was, he said, the less interested the patient was in learning about it. The culture of silence that has enshrouded the larger part of the atomic age can best be comprehended in that context, but it is an area where important research remains to be done. Weisman, for example, in his study of the terminal patient, *On Dying and Denying,* describes a level of awareness of one's death between denial and acceptance that he calls "middle knowledge." This idea may well apply to the many persons who consider, or even expect, a nuclear death on one hand, yet go on with their lives as if the threat did not exist. Are there psychological differences between this group, and a group of "pure" deniers? Or between those two and a group active in preventing nuclear war?

The facile acceptance of nuclear annihilation points to another common psychological defense, the isolation of affect [24]. "Nuclear war," a highly placed public official asserted, "is a destructive thing, but still in large part a physics problem" [25]. A second official from the Defense Department announced, "If there are enough shovels to go around, everybody's going to make it" [26]. In a lecture at the Livermore National Laboratory, a senior weapons consultant described a scenario for a likely nuclear war that involved the United States and the Soviet Union trading each other's cities which he called "a city strip" [27].

Rationalization and intellectualization provide relief to some. But Richter has suggested that in Western Europe the emotional burden of the bomb has been delegated to the young, who represent a politically unenfranchised social segment [28]. Feeling is vented, but little that is psychologically adaptive gets done by the adults.

Defenses against unabidable emotion such as fear and rage are often seen most transparently in children. For example, a child the author treated suffered from night terrors which were related to the death of a grandmother, followed by the development of a chronic illness in his own mother. Would his mother die as well? Who would take care of him if she died? How could he express his fear and rage toward her over his possible abandonment if she lay in a hospital bed? And so periodically he tore his dolls limb from limb. It is not unreasonable to hypothesize that if there is psychopathology attached to life in a nuclear age, it is likely to be more easily discovered in our children.

How much of the fear and rage of contemporary life is a function of death anxiety in general, and nuclear anxiety in particular? We are only now beginning to examine this question in earnest.

To tinker with ego defenses, however, is ofttimes to take them apart. The disruption of such psychological defenses, particularly those regarding nuclear annihilation, should not be undertaken with impunity. A psychiatrist, for example, writing a straightforward account of the effects of a nuclear war in the popular press reported that two-thirds of the 38 letters he received were characterizable as maladaptive responses, including four from readers who requested advice on preparing "a suicide kit" [29].

CHILDREN, DEATH, AND THE BOMB

A small but compelling psychiatric literature is appearing regarding the effects of nuclear weaponry on the attitudes of children [30]. Themes of despair, helplessness,

and the inevitability of nuclear annihilation dominate this disturbing literature, but efforts to differentiate the psychological conflicts of nuclear death from those of normative death have yet to be made.

A survey of 98 children between the ages of five and ten attempted, using an unbiased questionnaire, to delineate predominant themes in the sample. Questions were of the non-directive type, including "When the boy went to bed at nighttime, what did he think about?" Over 60 percent of the children spontaneously reported a theme of death. Every child seven or older had a comprehension of death, and only three out of 22 who were six or younger were totally ignorant of death [31].

Intimations of mortality are likely to be found at even earlier ages. A psychiatrist reports the following dialogue with his four-year-old son at the dinner table:

> "Dad, where does ham comes from?" he asks as his father cuts his dinner for him.
>
> "Ham comes from pigs," the man says.
>
> A moment of silence, and then, with more than a trace of horror in his voice, the boy asks, "You mean someone killed a pig?"
>
> "We didn't kill the pig," the father says somewhat disingenuously. "The butcher did."
>
> Another silence. And then with no small anguish, "But Dad. Pigs are nice!"

In a few sentences the four-year-old had established he understood the finality of death, that humans killed animals for food, and that he felt killing was not just. Yalom described a similar moment of realization for a boy at 18 months when he found a dead bird [32].

McIntire et al. surveyed nearly 600 children with regard to their perceptions of death, and made the striking discovery that seven-year-olds are more inclined to accept the irreversibility of death than eleven- and twelve-year-olds. It appeared that as children matured, they learned by the end of the latency period to deny the knowledge of mortality that they clearly possessed a few years before. Adolescents, on the other hand, suffered a crumbling of such denial, with a concomitant increase in introspection and an appreciation of the subject [33]. Yalom points out other defenses against death in a claim of specialness ("it can't happen to me"), death as the Ultimate Rescuer, or the rationalization that "children don't die."

With death as an epiphenomenon in the psychic lives of children, it should not be surprising to discover now that nuclear death had made its way into the minds of the young as well. In the early 1960s when a national controversy arose over air raid drills and fallout shelters, Escalona et al. surveyed 350 children with a non-directive questionnaire that included the following: "Think about the world as it may be about ten years from now. What are some of the ways in which it may be different from what it is today?" More than 70 percent of them spontaneously mentioned the atomic bomb either in connection with life underground or the possibility of wholesale destruction. Escalona's conclusion was "that growing up in a social environment that tolerates and ignores the risk of total destruction through voluntary human action tends to foster those patterns of personality functioning that can lead to a sense of powerlessness and cynical resignation." She further felt convinced that a "profound uncertainty about whether or not mankind has a foreseeable future ex-

erts a corrosive and malignant influence upon important development processes in normal and well-functioning children" [34]. While this cross-sectional survey does not directly demonstrate the validity of her premise, the proposition of a chronic psychological debility in children as a direct outgrowth of the nuclear arms race remains a compelling hypothesis for the behavioral scientist.

A much larger survey was done by Schwebel et al. [35] among junior high school and high school students at approximately the same time, but with a clearly nuclear focus to the questions that tended to deal with the prospects for war and the utility of fallout shelters. "Time and again," he reported, "they said . . . they would pay the biggest price." Asked if they cared about the nuclear threat, children answered, "Anyone who doesn't is insane." "Of course I care. Sometimes I cry when I think about it." "It keeps me awake at night." A sixth-grader in Tucson, which is ringed with Titan missiles and therefore a prime target for a first strike, said simply, "I'm scared and mad." A theme of helplessness was likewise present in this survey. "I'm outraged that leaders can consider the world's population expendable," a high school student said, "and there's just nothing I can do about it."

Fear, rage, and helplessness have their defenses, of course. The question, however, is whether an ego defense is adaptive or pathological and, furthermore, to what extent the adaptation of a particular defensive style helps to shape subsequent behaviors in development. It is disconcerting to note that in Schwebel's sample a number of students reported attitudes which were not adaptive, but involved the use of narcissism ("Why should I care if something like this happens in California?"), rejection of the future ("I don't look forward to the future"), and an acceptance of immediate gratifications with little forethought ("Sometimes, when I think that there may be no future at all, I feel just like letting myself go. Why wait?").

The most recent study of this kind was undertaken by a task force of the American Psychiatric Association [36], which between the years 1975 and 1980 interviewed several hundred high school students with a list of neutral questions regarding "nuclear developments." To the question, "What does the word 'nuclear' bring to mind?", answers were: "Big gray clouds, pipes and smokestacks, red warning lights, dead wildlife and humans, unnecessary deaths and bodies." Or, "Bombs, the world as nothing, completely wiped out." More ambivalent answers were: "Energy, society, advances, bombs exploding, people dying. . . ." Regarding whether "thermonuclear advances" affected their thinking about the future, answers included anger, despair, confusion, and hope, but virtually *no* denial of the issue. "I am constantly aware that at any second the world might blow up in my face." "I'm going to live for now." "I have now accepted the fact that there quite possibly will be an 'end of time'." Half of the 389 students interviewed in 1979, the year of the accident at the Three Mile Island nuclear power plant, felt that nuclear developments were influencing their plans for the future regarding marriage and the choice of a career. In a sample of 328 students a year later, a majority reported again that nuclear technology had affected their thoughts about marriage and children. Over 70 percent of the girls and 50 percent of the boys believed their lives would be shortened by nuclear waste.

It is important to recognize the methodological constraints of these studies. In a nuclear age in which each person is a potential nuclear victim, a control group not so exposed is neither easy to obtain nor likely to be created. A cross-sectional attitude survey does not directly document behavior. Nor does it say anything about the influence of such attitudes on individuals over time. But the consensual validation of

emotional distress in separate samples of children from different locales over a twenty-year span of time raises disturbing hypotheses in need of examination.

Does a life lived under the nuclear shadow become devalued for that individual? If so, how? Does that person reject the traditional social values of trust, perseverance, and the delay of immediate gratification? Is this person predisposed to rush into the impulsive use of drugs or sex without a reasonable degree of forethought? Does this person tend to reject the hard work inherent in stable relationships, scholarship, and vocational excellence? What, on the other hand, are adaptive responses to the nuclear shadow? Do they correspond to measures of psychological well-being? Can they be taught or arrived at by psychotherapy? The argument has been made by Lifton and others that causing the denial of annihilation to crumble is the first step toward emotional health in this unprecedented time. The fear, rage, and despair that mark this crumbling are beginning to be documented. But what are the adaptive steps beyond? Although the evidence is yet to be gathered, the case of 16-year-old Jane may illuminate the way, not only for behavioral scientists, but for her generation as well.

By many determinants Jane was a girl who ought not to have been troubled. The older child of two born to an upper middle-class professional couple, she attended a private school, carried no burden of genetic psychiatric illness within her, and appeared as a likeable, attractive girl on the threshold of adulthood. It was curious that she dressed in mismatched tatters and rags, significantly more so than any of her classmates. A therapist she consulted for depression and suicidal ideas questioned whether her appearance was a defense against sexuality, which she discounted, saying somewhat joylessly that she'd have sex if she "had the chance." She described symptoms of growing social isolation, decreasing interest in school, falling grades, and an increasing use of alcohol and marijuana. A school counselor "didn't understand" her. Her parents she saw as passive and irresponsible adults who exhibited no appreciation of the dangerous trends she perceived unfolding in the world around her. Jane in comparison had "always been interested in politics." She first became aware of the environmental impact of nuclear technology at the time of the Three Mile Island accident. From a sense of concern over ecological balance on the planet she sharpened her focus on the nuclear arms race but discovered that she was overwhelmed by anger, confusion, and despair. Nights and weekends she spent in "just getting drunk." Her unintoxicated personality was marked by sadness, passivity, and resignation. And then this common clinical story took an unexpected turn.

She happened to attend a lecture at her school on the medical effects of a nuclear war. Though she had intuitively understood the topic long before this lecture, afterward she felt for the first time that there might be a place for hope in her view of the world. That Christmas she instructed her parents to forego their usual gifts to her and to donate the money instead to an organization involved in education about nuclear war. In subsequent weeks she began to work as a volunteer for such a group, arranged for additional lectures in her high school, and began reading widely on the subject, on her own.

In the following months her physical appearance began to change. Her clothing was no longer in shreds. She began to smile. She was able to debate with her therapist a number of times with spirit and conviction. Her abuse of alcohol declined. She applied to college. It was as if her identity began to take shape around the task of contributing to planetary survival. It is not uncommon for a patient, particularly in adolescence, to emerge from a chaotic period by adopting an idea that provides

life with focus. But the case remains a cogent intimation of the kinds of premises waiting to be examined on the psychological dimensions of life under the nuclear shadow.

THE DOCTORS' DILEMMA

While much has been written regarding the medical effects of nuclear war, less attention has been paid to defining the physician's role in its prevention. Two basic positions are apparent from this modest literature. The first is that physicians must retain their identity as apolitical servants of the sick; and the second, that physicians as advocates of public health must inevitably be drawn into matters of public policy.

The history of the separation of medicine from politics is a venerable one. Oliver Wendell Holmes in an essay intended for the young physician warned, "Do not dabble in the muddy sewer of politics." Ostensibly recognizing the universal physical and spiritual needs of soldiers in battle, Napoleon asserted, "A physician and a priest ought not to belong to any particular nation, and [ought to] be divested of all political opinions."

Much of the call for a separation of medical science and politics was rooted in a need to free the former from the dogmatic constraints of government and religion. If reason were to reign supreme, as Bacon declared it must, it could not be tied to tradition or magic, valuable as the latter had been to the origins of medicine. The testing of theory with experiment was the critical idea that set the stage for the scientific and medical revolution.

But a call for the pristine isolation of medical science from political and economic forces has prevailed more in theory than in fact. As early as the fifteenth century, links between medicine and social variables began to be forged. In 1473, Ulrich Ellenbog wrote a pamphlet describing "the poisonous wicked fumes and smoke" afflicting goldsmiths, a finding that linked disease with economic activity. The father of occupational health, Bernardino Ramazzini, wrote the first text on disease in the workplace, *De morbis artificum diatriba,* in 1700. The dawn of public health, beginning in nineteenth-century England, where the interrelationships between poverty, disease, and the physical environment had become apparent, created ties between medicine and statecraft that have continued to the present. Today the inventory of interactions between medicine and the state extends across hundreds of years and touches on such widely different topics as child labor, pure food, public housing, medical research, and the rise of third-party health insurers. The need to relate medicine to its political milieu was realized by the pathologist, Virchow, who wrote in 1849, "Medicine is a social science in its very bone and marrow . . . it is wrong to believe that, in contrast to the political and religious sciences, the natural sciences can gaze into the deepest wellsprings of knowledge without feeling the desire to apply what they know. Let us recall the saying of Lord Bacon that knowledge is power, and be satisfied with nothing less from our great and promising science, of which Hippocrates once said: *Quae ad sapientiam requiruntur, in medicine insunt omnia"* ("Everything which is sought in the name of knowledge belongs to medicine") [37].

In the nuclear age, however, the question remains: if nuclear war is to be prevented, how far does the responsibility of physicians go in achieving that end? Lown et al. [38] stress that physicians serve as public educators and a "potentially forceful, nonpolitical pressure group for rational control of these destructive weapons." Relman, speaking on the same issue, argues that physicians should only take public stands on issues in which they have special expertise, but should shun comment on issues such as nuclear strategy which he suggests are "purely political"

[39]. Another physician, a former official of the American Psychiatric Association, felt even that position was not appropriate for the profession, and argued against a symposium on the psychological aspects of the arms race on the grounds that the topic was political, not medical [40].

Following a similar line of thinking a second psychiatrist argued, "Psychiatrists are ethically bound not to misuse the transference power they hold over their patients." She further implied that part of the medical concern over nuclear war arose from unresolved emotional conflicts within the physicians themselves, saying, "On a personal and professional level, psychiatrists have humanistic concerns. Their dilemma is to differentiate and discern their own needs from those of their patients. They cannot impose on them even their most humanistic concerns" [40]. The psychiatrist did not address the fact that nuclear war threatens doctor and patient equipotently.

Part of the confusion within the medical profession regarding its role in preventing nuclear war is that the profession lacks a canon of ethics regarding political activity. A second problem is that expertise in general, and medical expertise in particular, are too often placed on a higher plane than data that relates to the problem at hand. Relman, for example, feels "physicians have no obligation to speak out, as physicians, on public issues in which they have no special expertise [because] they risk losing the confidence of their fellow citizens." Implied in this argument is that doctors have nothing to teach about, for example, arms control, regardless of the data they may acquire on the subject. Unfortunately, this position is close to a reliance on the rule of authority, and precisely the tradition with which the scientific method broke in the first place.

Finally, medical leaders at times appear to imagine a clear line dividing medical from political activity, when it may be more precise to consider that the two occupy different points on the same social continuum. There may be acts that are purely political and purely medical, but they are surely far less common than those that possess varying components of each.

Virchow conceptualized this interrelationship not as an actuality, but as a goal for the future. "Should medicine ever fulfill its great ends," he wrote, "it must enter into the large political and social life of our time; it must indicate the barriers which obstruct the normal completion of the life-cycle and remove them. Should this ever come to pass, Medicine, whatever it may then be, will become the common good of all" [41]. It is clear that, wanted or not, the crisis of the nuclear age is drawing the medical profession into a historically unprecedented political role. The extent to which this involvement alters the face of medicine is a subject that is overdue for examination.

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